PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Empathy, burnout and the use of gut feeling: a cross-sectional survey of Danish general practitioners
AUTHORS	Pedersen, Anette; ingeman, Mads; Vedsted, Peter

VERSION 1 – REVIEW

REVIEWER	Oriol Yuguero IRBLleida, Spain.
REVIEW RETURNED	23-Oct-2017

GENERAL COMMENTS	Thank you for allowing me to review this work. It seems to me an interesting article that can provide information on a topic that is on the rise in the doctor-patient relationship. However, I think there are some aspects to improve. I believe that a more adequate bibliographic review should be done both in the background and in the discussion. The majority of articles are prior to 2015, and in recent years, there have been several works around empathy and burnout in healthcare professionals. In the introduction, I think it is necessary to develop the concept of empathy more, since if they develop burnout and gut feeling. Finally I think that the fact that in a survey on burnout and empathy of professionals is economically incentive to professionals is a limitation. The response rate is high, but I do not know if it would have been the same if there had not been such gratification. You can probably mask the results. It could be that those burned professionals respond to get the economic benefit and bias the results. I think it should be better explained because a study in which study participants receive financial compensation should not be evaluated by the clinical research ethics committee.

REVIEWER	F.A.W.M. Derksen Dr. Frans Derksen Researcher Primary Health Care/ Gender & Women's Health Frans.Derksen@radboudumc.nl Radboud university medical center Dept. of Primary and Community Care P.O. Box 9101 6500 HB Nijmegen The Netherlands
REVIEW RETURNED	25-Oct-2017

GENERAL COMMENTS	This is very helpful paper on an important topic. Because too little

	research has been performed about the way empathy is efficient in patient-GP communication I read this manuscript with much pleasure. With this quantitative study a robust connection is underlined between empathy and GPs' feelings of intuition. It has the great strength of exploring empathy as an important part in the GPs' diagnostic GPs' process (the intuition part). With help of empathy attention to emotional signs (cues) during the consult enables a GP's gut feeling (intuition). I surely hope it can be published after improvement. The Abstract presents the central themes from the research and summarized the project well. The Introduction section delivers a clear explanation of the concept of gut feelings. However some aspects are duplicated in the discussion section (see further). The paragraph about a process of identical emotions of patient and GP makes me very curious about this aspect (see my remarks about this aspect in the discussion paragraph). The Method section clearly describes the study design. However, does there exist a questionnaire with the questions about the how and the content of the participants' gut feelings. How are these assessed or questioned? Discussion: Strengths and Limitations: Correctly the authors mention the JSPE a limitation. And they clearly explain this limitation, doctor rated and probably measuring a doctor's attitude to empathy. I wonder if the authors have thought about explaining about other measures such as CARE and RIAS measure. Comparison with existing literature: This section starts with a paragraph which duplicates parts of the introduction section. I think this is unnecessary. At the end of this section again gut feelings are explained and connected to the findings of this study. I would prefer to start with this part. The part about burn out is too much and confusing (first study…. Fourth study). Generally spoken the discussion about a connection between empathy and burn out persists mixed and controversial (as been said by the authors, and I agree). So I would shorten or concentrate this paragraph. Of much more interest and innovative is the section (on page 15, sentence 44 and further) about emotions in daily practice; it is about being resonant with each other's (patients and GPs) emotions. And the role this plays in the gut feeling. It's a rather new concept, perhaps GPs' age-depending, which needs in this paragraph somewhat more detail and structure.

REVIEWER	Erik Stolper Maastricht University, Department of General Practice, Maastricht, the Netherlands
REVIEW RETURNED	04-Nov-2017

GENERAL COMMENTS	Dear authors, with much pleasure I read your manuscript. The topic is very interesting as you will understand from my point of view. Please find below some remarks and –I hope constructive- criticism. 1) Please I would like to know the precise formulation of the item

	about gut feelings and I am quite sure that other readers could have the same question. 2) Please make clear how the standardized procedure of the linguistic validation procedure of the both used scales has been done. 3) Your hypothesis about the relation between empathy and gut feelings is probable but was not mentioned in the publications of my research group. Your conclusion that the way patients sat or spoke could be triggers for gut feelings is correct but perhaps you are wrong in translating this observation into a patient worry that a GP with higher levels of empathy may observe. GPs know the normal pattern of their patients' attitude –the way they speak, sit, look etc.- and when that normal pattern changes it might be a trigger for a gut feeling. What we mean is a kind of pattern failure as a trigger and not the transfer of a patient gut feeling to the GPS. Of course that could be happening but that is not what we found in our studies. 4) In my view, you have to theoretically explain why doctors with a high level of empathy are much more familiar with gut feelings than their colleagues with a low level of empathy. I don't expect a full concept about this relation but at least some indications how we can understand it based on current scientific insights like e.g. mirror neurons. 5) Our group is busy now with studying the gut feelings of patients. We are quite sure that patients have gut feelings in line with the study of Ann van den Bruel (ref. 1) and we want to know what kind of phrases and wordings patients use to express their gut feeling. Our aim is to compose and validate a gut feelings questionnaire for patients. It would be a valuable idea to study the association between the gut feelings of patients, the gut feelings of GPs and the outcome of a referral or non-referral after say 3 months. Perhaps we then can be able to make probably that the gut feelings of patients influence those of their GPs. 6) I am not sure that Ann van de Bruel found in her study a relation between the gut feelings of the caregiver and the gut feelings of the GP. She only showed that the caregiver's gut feelings –there is something with my child- had a high positive predictive value. Moreover there are many studies where researchers tried to separate the outcomes of non-analytical reasoning from analytical reasoning, e.g. Sick or not sick by Wiswell et all. or Eyeballing: the role of visual appearance to diagnose 'sick' by Sibbald. 7) In our concept, non-analytical reasoning and analytical reasoning are always interacting, checking each outcomes. When a GP has a gut feeling he often will look better, searching for triggers, asking more questions and considering serious working hypotheses. Perhaps he/she will find a trigger or an explanation. We think that the role of gut feelings in the process of diagnostic reasoning is probably more important than the question about how often a gut feeling is right or wrong. 8) About the role of gut feelings in GPs traineeship, see our publication. [1] 9) In my view, your manuscript can substantially be improved. 1. Stolper CF, Van de Wiel MW, Hendriks RH, Van Royen P, Van Bokhoven MA, Van der Weijden T, Dinant GJ: How do gut feelings

	feature in tutorial dialogues on diagnostic reasoning in GP traineeship? Adv Health Sci Educ 2014.

VERSION 1 – AUTHOR RESPONSE

Reviewer # 1

Re point 1. I believe that a more adequate bibliographic review should be done in the background and in the discussion. The majority of articles are prior to 2015, and in recent years, there have been several works around empathy and burnout in healthcare professionals.

Response: In the paragraph about the association between empathy and burnout (Introduction section), we have replaced some of the papers published before 2015 with two papers from 2016 and 2017, respectively.

Re point 2. In the introduction, I think it is necessary to develop the concept of empathy more, since if they develop burnout and gut feeling.

Response: We have added a short presentation of the concept of physician empathy to the Introduction section.

Re point 3. I think that the fact that in a survey on burnout and empathy of professionals is economically incentive to professionals is a limitation. The response rate is high, but I do not know if it would have been the same if there had not been such gratification. You can probably mask the results. It could be that those burned professionals respond to get the economic benefit and bias the results. I think it should be better explained because a study in which study participants receive financial compensation should not be evaluated by the clinical ethics committee.

Response: In Denmark, it is customary to compensate general practitioners for their time when they participate in research projects. We have added this information to the Methods section.
We disagree with the reviewer that financial compensation biases the results. On the contrary, we believe that financial compensation increases response rate and thereby increases the likelihood that burned-out GPs will also participate in the survey and reduces risk of selection bias. In Denmark, the ethical committee does not evaluate questionnaire surveys as stated in the Methods section and this rule is independent of financial compensation.

Reviewer # 2

Re point 1. Does there exist a questionnaire with the questions about the how and the content of the participants' gut feelings. How are these assessed or questioned?

Response: The information about assessment of gut feelings in the survey has been added to the Methods section.
Re point 2. Correctly the authors mention the JSPE a limitation. And they clearly explain this limitation, doctor rated and probably measuring a doctor's attitude to empathy. I wonder if the authors have thought about explaining about other measures such as CARE and RIAS measure.

Response: Both the CARE and the RIAS would be valid and reliable instruments for the assessment of physician empathy. Meanwhile, since CARE is responded by the patient and RIAS is based on sequence analysis of audiotaped consultations, neither of the two instruments could be used within the present study design.

Re point 3. Discussion section, comparison with existing literature: This section starts with a paragraph which duplicates parts of the introduction section. I think this is unnecessary. At the end of this section again gut feelings are explained and connected to the findings of this study. I would prefer to start with this part.

Response: We have followed the suggestions of the reviewer and have reorganised the section concerning comparison with existing literature (please see also our response to reviewer # 3 point 3).

Re point 3 – continued. The part about burn out is too much and confusing (first study … Fourth study). Generally spoken the discussion about a connection between empathy and burn out persists mixed and controversial (as been said by the authors, and I agree). So I would shorten or concentrate this paragraph.

Response: We thank the reviewer for pointing this out. The paragraph has been shortened.

Re point 4. Of much more interest and innovative is the section (on page 15, sentence 44 and further) about emotions in daily practice; it is about being resonant with each other's (patients and GPs) emotions. And the role this plays in the gut feeling. It's a rather new concept, perhaps GPs' age-depending, which needs in this paragraph somewhat more detail and structure.

Response: We agree with the reviewer that our proposed hypothesis about affective resonance as a trigger of gut feelings was not stated clearly enough. We have reorganised the section with the intention to make it more clear how our hypothesis differ from previous approaches to gut feelings (please see also our response to reviewer # 3 point 3 og 4).

Reviewer # 3

Re point 1. Please, I would like to know the precise formulation of the item about gut feelings and I am quite sure that other readers could have the same question.

Response: The information about assessment of gut feelings in the survey was also requested by reviewer # 2 and has been added to the Methods section.

Re point 2. Please make clear how the standardized procedure of the linguistic validation procedure of the both used scales has been done.

Response: This information has now been added in the Methods section. We now state that the JSPE and MBI-HSS were translated into Danish in accordance with the WHO guidelines and that the translation process included a forward translation and an expert panel back-translation and pilot testing of translated version.

Re point 3. Your hypothesis about the relation between empathy and gut feelings is probable but was not mentioned in the publications of my research group. Your conclusion that the way patients sat or spoke could be triggers for gut feelings is correct but perhaps you are wrong in translating this observation into a patient worry that a GP with high levels of empathy may observe. GPs knows the normal pattern of their patients' attitude – the way they speak, sit, look etc. – and when that normal pattern changes it might be a trigger for a gut feeling. What we mean is a kind of pattern failure as a trigger and not the transfer of a patient gut feeling to the GPs. Of course that could be happening but that is not what we found in our studies.

Response: We thank the reviewer for pointing out that we were not sufficiently clear in our presentation of your results saying that gut feelings are triggered by pattern failure as well as our hypothesis about transfer of patient's affective state to the GP. We have elaborated on this and we now emphasize that our hypothesis is not diverted from the findings of your study group but arise from our findings revealing a strong association between empathy and gut feelings.

Re point 4. In my view, you have to theoretically explain why doctors with a high level of empathy are much more familiar with gut feelings than their colleagues with a low level of empathy. I don't expect a full concept about this relation but at least some indications how we can understand it based on current scientific insights like e.g. mirror neurons.

Response: We have added a short description of the mirror neuron system and we suggest this system as a neurobiological basis for the transference of patients' gut feelings to GPs. We appreciate that the reviewer pointed out this clear shortcoming of our proposal of patient emotions as a trigger of gut feelings (cf. our response to your point 3).

Re point 5. Our group is busy now with studying the gut feelings of patients. We are quite sure that patients have gut feelings in line with the study of Ann van den Bruel (ref. 1) and we want to know what kind of phrases and wordings patients use to express their gut feeling. Our aim is to compose and validate a gut feelings questionnaire for patients. It would be a valuable idea to study the association between the gut feelings of patients, the gut feelings of GPs and the outcome of a referral or non-referral after say 3 months. Perhaps we then can be able to make probably that the gut feelings of patients influence those of their GPs.

Response: Thank you for sharing these interesting studies from your study group with us. As part of our response to your point 3 and 4, we have added that more research is needed concerning the validity of patients' gut feelings as a basis for focusing on the possible importance of the transfer of a patient gut feeling to the GP.

Re point 6. I am not sure that Ann van de Bruel found in her study a relation between the gut feelings of the caregiver and the gut feelings of the GP. She only showed that the caregiver's gut feelings – there is something with my child – had a high positive predictive value.

Response: Our presentation of the results of the study by Van den Bruel et al. in the Introduction section has been changed. We now note that parental concern was present in 33% of cases where gut feeling was present despite that the clinical impression was that of a non-serious illness and in only 2% of similar non-serious cases where gut feeling was absent.

Re point 6 – continued. Moreover, there are many studies where researchers tried to separate the outcomes of non-analytical reasoning from analytical reasoning, e.g. sick or not sick by Wiswell et al. or Eyeballing: the role of visual appearance to diagnose 'sick' by Sibbald.

Response: We're sorry for having mixed up two discussion issues. Our intention was not to discuss whether empirical studies have separated the outcomes of non-analytical and analytical reasoning. Meanwhile, this intention could be derived from our former wording of the paragraph. Rather, our intention was to emphasize that studies have weighted differently the lack of specific indications regarding the sense of alarm as described in the Stolper definition. In the studies of Wiswell et al. and Sibbald et al., red flag symptoms (i.e. a specific indication) may potentially have triggered the gut feeling, whereas the study by Van den Bruel et al. distinguishes itself by approaching gut feelings as an intuitive feeling, which could arise despite that the clinical impression suggests a non-serious illness. We hope that this distinction is now more evident from the revised paragraph in the Introduction section.

Re point 7. In our concept, non-analytical reasoning and analytical reasoning are always interacting, checking each outcomes. When a GP has a gut feeling he often will look better, searching for triggers, asking more questions and considering serious working hypotheses. Perhaps he/she will find a trigger or explanation. We think that the role of gut feelings in the process of diagnostic reasoning is probably more important that the question about how often a gut feeling is right or wrong.

Response: Unfortunately, we are not aware of which part of our paper the above comment is directed against. Our confusion may be a consequence of the comment addressing the separation of outcomes of non-analytical and analytical reasoning mentioned in the previous point. We hope that we have addressed the comment sufficiently in our response to point 6 – continued.

Re point 8. About the role of gut feelings in GPs traineeship, see our publication (ref).

Response: We have added the findings of this interesting study to the paragraph about the role of gut feelings in GP traineeship.

Re point 9. In my view, your manuscript can substantially be improved.

Response: We find that the manuscript has substantially improved due to the processing of the appointed shortcomings of the paper. We hope the reviewers also find that the paper has benefitted from their constructive criticism.

VERSION 2 – REVIEW

REVIEWER	Oriol Yuguero IRB Lleida
REVIEW RETURNED	10-Dec-2017

GENERAL COMMENTS	Many thanks for your response. You have addressed all the requirements, and justified all the points that could limitate the paper. Well done.

REVIEWER	frans derksen Radboud university, Nijmegen , The Netherlands
REVIEW RETURNED	07-Dec-2017

GENERAL COMMENTS	The manuscript has been improved thoroughly. And it has become a very interesting article which discusses an important aspect of daily GP practice in an instructive and innovative way.

REVIEWER	Erik Stolper Maastricht University, the Netherlands
REVIEW RETURNED	06-Dec-2017

GENERAL COMMENTS	Dear authors, thank you for your answers to my questions and your improvements. I would like to make some more comments. Perhaps you can use them further. 1) In your abstract, you start with an hypothesis (first

	sentence). Based on this first hypothesis you formulate a second hypothesis: there is a relation between the use of gut feelings and empathy. In the results, you find an association between the use of gut feelings and empathy. But say the first hypothesis is non-sense what would that mean for the relevance of your outcome? In my view you might explain your results by using your first hypothesis. By starting with the first hypothesis and afterwards using the same one to explain your results…that looks like a circle reasoning. Do you agree? 2) A to sentence 31: you can read in our –referred- article that it was Hamm (ref 52 in this review) who mentioned the continuum model. 3) As to sentences 39-47: we stated that 'even though specific indications are lacking' (your sentence 24). So your comments in 39-47 are a bit curious. We did not emphasize the lack of arguments but stated that 'even when …'. I do agree that when you would find a tumour in abdomen you got a sense of alarm which is not illogical of course. But nevertheless the doctor has a gut feeling, hasn't he? You may criticize that the predictive value of a gut feeling in that specific case is high obviously. 4) In our Delphi consensus procedure, we reached a point where we decided to skip all connotations of empathy used by the participants because that was not what we meant with gut feelings, i.e. what we wanted to study in future research. We described our decision in our publication. Gut feelings are not about empathetic feelings toward the patient. 5) Imagine a physician who has a low degree of empathy but has a high degree of gut feelings (he fits into your numbers doesn't he?), how do you explain this finding? I ques because he has problems to feel the mental state of his patient but still his knowledge of disease patterns, of his patient's normal behaviour and of the behaviour of healthy people in general might induce perfect gut feelings. Are you with me? What does this mean for your discussion section? Your analysis of the data is splendid but the interpretation of your findings could be incorrect or at least a bit one-sided. 6) My last item: in the study mentioned in ref 2, the authors found a relation between the PPV of gut feelings and the experience of GPs (expressed in the age of GPs which is not completely the same but still…). I wish you the very best of luck and hope you can improve your manuscript. Erik Stolper

VERSION 2 – AUTHOR RESPONSE

Reviewer # 3

Re point 1. In your abstract, you start with an hypothesis (first sentence). Based on this first hypothesis you formulate a second hypothesis: there is a relation between the use of gut feelings and empathy. In the results, you find an association between the use of gut feelings and empathy. But say the first hypothesis is non-sense what would that mean for the relevance of your outcome? In my view you might explain your results by using your first hypothesis. By starting with the first hypothesis and afterwards using the same one to explain your results…that looks like a circle reasoning. Do you agree?

Response: We apologize for being unclear in the abstract. The first sentence is not a hypothesis, but a reference to empirical findings (Van den Bruel et al. Clinicians' gut feeling about serious infections in children: observational study. BMJ 2012). To be clearer, the first sentence now sounds as this: Research has suggested that physicians' gut feelings are associated with parents' concerns for the well-being of their children.

Re point 2. A to sentence 31: you can read in our –referred- article that it was Hamm (ref 52 in this review) who mentioned the continuum model.

Response: The cited reference has been changed to a more appropriate source of the cognitive continuum theory (Hammond et al. 1987: Direct comparison of the efficacy of intuitive and analytical cognition in expert judgment. IEEE Transactions on Systems, Man, and Cyberneticss, vol. 17(5): 753-770).

Re point 3. As to sentences 39-47: we stated that 'even though specific indications are lacking' (your sentence 24). So your comments in 39-47 are a bit curious. We did not emphasize the lack of arguments but stated that 'even when …'. I do agree that when you would find a tumour in abdomen you got a sense of alarm which is not illogical of course. But nevertheless the doctor has a gut feeling, hasn't he? You may criticize that the predictive value of a gut feeling in that specific case is high obviously

Response: In your paper "Consensus on gut feelings in general practice" (BMC Family Practice 2009; 10: 66), gut feeling/a sense of alarm is defined as "an uneasy feeling perceived by a GP as he/she is concerned about a possible adverse outcome, even though specific indications are lacking: There's something wrong here" (p. 4 of 6). Based on this definition, we see the lack of specific indications as a precondition for gut feeling (specific indications ARE lacking) and as the condition, which separates gut feeling from the conscious recognition of red flag symptoms. Meanwhile, from your comment above, we now understand that what you actually mean is "an uneasy feeling perceived by a GP as he/she is concerned about a possible adverse outcome, even though specific indications MIGHT BE lacking".
We have addressed this by adding that we cannot rule out gut feelings when a doctor finds a tumour in the abdomen, but assume that the decision-making in such case must also contain an element of conscious rule-based reasoning saying that tumours in the abdomen might be malignant.

Re point 4. In our Delphi consensus procedure, we reached a point where we decided to skip all connotations of empathy used by the participants because that was not what we meant with gut feelings, i.e. what we wanted to study in future research. We described our decision in our publication. Gut feelings are not about empathetic feelings toward the patient.

Response: We of course respect the conclusion made on basis of the Delphi procedure. We do not conclude that gut feelings are empathic feelings directed at the patient, but rather that physician empathy correlates with use of gut feelings as revealed by our analyses.
In your paper describing the Delphi procedure, several participants associated gut feelings with feelings of empathy towards the patient. Empathy was separated from gut feelings and according to your paper, empathy comes into play only after the diagnosis has been established whereas the gut feelings are used in the diagnostic process. During the second round of the Delphi procedure, participants were asked to use this assumption of separation between empathy and gut feeling as a starting point, but as stated in your paper "Several collegues expressed their disagreement with this decision in their ratings" (Stolper et al. Consensus on gut feelings in general practice. BMC Family Practice 2009; 10: 66, p. 4 of 6).

To address this issue, we have added your separation of empathy and gut feelings in the Discussion section when we compare our findings with previous literature.

Re point 5. Imagine a physician who has a low degree of empathy but has a high degree of gut feelings (he fits into your numbers doesn't he?), how do you explain this finding? I ques because he has problems to feel the mental state of his patient but still his knowledge of disease patterns, of his patient's normal behaviour and of the behaviour of healthy people in general might induce perfect gut feelings. Are you with me? What does this mean for your discussion section? Your analysis of the data is splendid but the interpretation of your findings could be incorrect or at least a bit one-sided.

Response: Our results reveal an association between empathy and gut feeling. This does not mean that all empathetic GPs use gut feelings and all unempathetic GPs never use gut feelings. Our results suggest that if you meet an empathetic GP, then he/she is more likely to use gut feelings than not using gut feelings.
We believe that we have made the proper reservations in our conclusions, and we already mention that the revealed association between empathy and gut feeling does not exclude that deviations from patient's normal behaviour etc. may also trigger gut feelings. Therefore, we have not made any changes according to this comment.

Re point 6. My last item: in the study mentioned in ref 2, the authors found a relation between the PPV of gut feelings and the experience of GPs (expressed in the age of GPs which is not completely the same but still…).

Response: We thank the reviewer for making us aware of this finding. We now cite the findings of the study by Donker et al. (2016) when we discuss the mixed findings concerning age/experience and use and precision of gut feelings.

VERSION 3 – REVIEW

REVIEWER	Erik Stolper Maastricht University in the Netherlands
REVIEW RETURNED	20-Dec-2017

GENERAL COMMENTS	Thnx for your reply and adaptations